DOCUMENT RESUME

ED 030 490 PS 002 013

By-Weikart, David P.

Preliminary Results From a Longitudinal Study of Disadvantaged Preschool Children.

Ypsilanti Public Schools, Mich.

Spons Agency-Michigan State Dept. of Public Instruction, Lansing.; Office of Education (DHEW), Washington, D.C. Cooperative Research Program.

Pub Date 67

Note-19p.; Paper presented at the 1967 Convention of the Council for Exceptional Children, St. Louis, Missouri

EDRS Price MF-$0.25 HC-$1.05

Descriptors-Achievement, Behavior Rating Scales, Control Groups, *Culturally Disadvantaged, Enrichment Programs, Experimental Groups, High Achievers, Intelligence Quotient, Intervention, *Longitudinal Studies, Low Achievers, Preschool Children, *Preschool Programs, *Program Effectiveness

Identifiers-California Achievement Test, *Perry Preschool Project, Pupil Behavior Inventory, Stanford Binet Intelligence Scale, Ypsilanti Rating Scale

The Perry Preschool Project in Ypsilanti, Michigan, is structured so that a group of disadvantaged 3-year-old Negro children begin a 2-year preschool program each year. The program was originally very verbal-learning oriented but has recently been modified to make use of Piaget's cognitive development theories. From the beginning of the program through formal school, the participants are tested each year. These tests provide longitudinal data. Each group of participants is matched by a control group of children who receive no preschool program. The first experimental group started in 1962. Test results and teacher ratings of this first group over the succeeding years show that (1) no differences in measured intellectual growth between the experimental and control group has endured by the third grade. (2) the experimental children have demonstrated superior academic achievement and social behavior; and (3) the experimental group can be divided into two groups, achievers and nonachievers. The last finding means that some children significantly benefit from the preschool program while some do not, a result not explicable at this time. (WD)

U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

OE/BESE TITLE I

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

EDO 30490

Preliminary Results from a Longitudinal Study of Disadvantaged Preschool Children[a]

David P. Weikart
Ypsilanti Public Schools
Ypsilanti, Michigan

Preschool intervention programming has been widely hailed as an effective technique for preventing the developmental deficits common among culturally disadvantaged children. Interest in such programming is high because early childhood seems to be the most promising time for effecting desired changes in intellectual growth patterns, establishing the basis for academic learning, and for assisting social adjustment in general. While theoretical bases point to an unusual potential for success in preschool education, research results in the field have been disappointing. Research so far has reported few if any differences between children attending or not attending preschool by the time they reach third grade. Although results from the Perry Preschool project are still preliminary, sufficient data are available to draw tentative conclusions. The results are not as encouraging as some might have hoped, nor as bleak as some might have predicted.

This paper will report the longitudinal findings derived from the initial pilot group, "Wave O," who enrolled in the project in the fall of 1962. While data are available from a variety of assessment procedures, the information presented will be on intellectual growth as measured by the Stanford-Binet Intelligence Scale, on achievement patterns as assessed by the California Achievement Test, and on school behavior as rated by the Pupil Behavior Inventory and the Ypsilanti Rating Scale. The last section of this paper will report on some initial findings about children from the experimental group who are achievers, compared to those who are non-achievers three years after their participation in the project.

---

[a] Paper presented at the 1967 convention of the Council for Exceptional Children, St. Louis, Missouri.

PS 002013

Overview of the Project. The Perry Preschool Project[a], as part of its objectives, assesses the longitudinal effects of a two-year preschool program designed to compensate for the mental retardation associated with cultural deprivation. The program consists of a cognitively oriented preschool education program and home visits to involve mothers in the educative process. The project has been in operation since September, 1962, and is scheduled to be completed in December, 1967.[b]

The population from which each year's sample is selected is Negro, culturally deprived, and diagnosed as mentally retarded. Control and experimental groups are equated for mean cultural-deprivation rating and mean Stanford-Binet IQ. Other measures include the Leiter International Performance Scale, the Peabody Picture Vocabulary Test, the Illinois Test of Psycholinquistic Abilities, and a shortened form of the Parental Attitude Research Instrument, and various school measures such as achievement tests, teacher ratings, and attendance records.

The cognitive preschool program is a permissive teacher-structured curriculum that helps youngsters increase their cognitive development. Heavier emphasis is placed on verbal stimulation and interaction, dramatic play, and field trips than on social behavior and other more common concerns of traditional nursery school.

Weekly home visits provide each family with an opportunity for personal contact with one of the child's teachers. The mother is encouraged to participate in the actual instruction of her child, thereby increasing her understanding of school, teachers, and the educative process. The teacher's demonstration of child-management techniques indirectly teaches the mother alternative ways of handling her own children.

---

[a]The research reported herein has been supported through the Cooperative Research Program of the Office of Education, U.S. Department of Health, Education, and Welfare, since January 1, 1964, and by the Ypsilanti Board of Education, the Washtenaw County Board of Education, and the Department of Public Instruction of the State of Michigan, since September 1, 1961.

[b]More complete details can be found in other reports of the project: Weikart, D. P., Preschool Intervention: A Preliminary Report of the Perry Preschool Project. Ann Arbor, Michigan: Campus Publishers, 1967.

Group meetings for the mothers and fathers of preschool children provide opportunities for discussing problems relating to children's education and upbringing. This group approach reinforces changes in individual parent's views about the education of his children.

The Project involves youngsters who attend preschool for two years. A new pair of three-year-old experimental and control groups is added each year to previous samples so that a series of replications combine to create a sufficient number for longitudinal study. The various groups who participate in the project are designated as "Waves." Wave O and Wave 1 started preschool in the fall of 1962. At that time, the Wave O children were four years old. Wave O youngsters have spent a year each in the nursery, kindergarten, first and second grades and are now in the third grade. Wave 1 and all subsequent Waves have had two years of preschool education. Wave 5 started the program in the fall of 1967. This report will discuss only Wave O.

The Population. Ypsilanti and the surrounding township form a community of 50,000 persons on the fringe of the metropolitan Detroit area. Within 10 miles are two major state universities: the University of Michigan and Eastern Michigan University, five major hospitals, many industrial plants, and the usual small service businesses. The community has the lowest tax base of any unit in the county. Since housing is cheaper in Ypsilanti than surrounding communities, and since the city has the only public housing in the county, many working class families have settled in the city even though they may work elsewhere.

About 25% of the Ypsilanti population is Negro with few in the middle-class or above. Because of traditional housing patterns, almost all of these Negroes live in the southwest section of the city, where, for the most part, their children attend Perry School. Because of the problems experienced in educating lower-class Negro children, it was determined to locate the project in the Perry area.

Selection of the Yearly Samples. To reach the total preschool population in the Perry School area, the school-census information is reviewed in the fall of each year to locate the families who were not surveyed in the

spring. Interviews are held with these families, and data pertaining to socio-economic status are collected. From these data, a cultural deprivation (C.D.) rating[a] is calculated.

1. The father's occupation on a 4-point scale (or the mother's occupation if no father lives in the home.) (One point for unskilled, 4 points for skilled work.)
2. Average number of years of education completed by the mother and the father (or by the mother only, if no father lives in the home.)
3. Density in the home (Number of rooms/number of people), multiplied by 1/2 to give this ratio a 1/2 weight.

Each component is divided by its standard deviation to equate the different distributions. The cultural deprivation ratings of the families with children of appropriate ages ranged between 5.3 and 16.8. A cut-off point of 11 is used as the upper limit.

The next procedure is to administer the Stanford-Binet Intelligence Scale to the children with a C.D. rating below 11. Only those children who are evaluated by the examining psychologist as educably mentally retarded, with no major organic involvement, are considered eligible for the preschool program. The obtained scores are regarded as a function of cultural deprivation and, as such, indicate those children who need assistance.

The specific sample of each wave of the Perry Preschool Project is composed of three-year-old children who live within the boundary of the Perry School district, come from culturally deprived families, and test in the range of "educably mentally retarded."

The experimental and control groups are matched initially on two selection criteria: Cultural deprivation and mental retardation. Two additional factors, sex ratio and percentage of working mothers are also balanced when possible. Descriptive data on the experimental and control groups of Wave O can be found in Table 1. The project has experienced little difficulty in gaining cooperation of parents whose children have been selected to participate in the project.

---

[a]This C.D. index is an adaptation of the one used by Martin Deutsch of the Institute of Developmental Research in New York City.

Insert Table 1 About Here

The Instructional Program. The only requirements outlined for the instructional program of the project were that it be designed to compensate for and prevent further cognitive deficiencies and that it operate five days a week three hours per day. The Project does not attempt to assess different methods of educational intervention. Wave O, 1, and 2 were exposed to a gradually evolving program with an instructional method that can best be described as "verbal bombardment." In this method, the teacher maintains a steady stream of questions and comments to draw the child's attention to aspects of his environment. This "bombardment" does not necessarily demand answers on the part of the children. It is used when rewarding a child for good performance, when disciplining him, and when presenting academic material. The complexity of the language is increased as the child's verbal ability develops. An observer in preschool might receive the impression that the teacher is acting like a middle-class mother interacting with her young children.

Wave 3 and succeeding Waves of the project are experiencing a somewhat different program. A program based upon Piaget's cognitive development theory has been implemented. This new instructional program can be best described as an effort to establish firmly the precursor thought to be essential for the child's development of an adequate foundation for the growth of language and logical thought.

FINDINGS

Preschool must demonstrate ability to affect the general development of children in three areas. These are intellectual growth, academic achievement, and school behavior. It is critical that the effects of preschool programming be observable several years after the experience and that they be measured by instruments that are at least systematic if not standardized. Although it may be too much to expect that a single preschool experience of eight weeks or even two years affect the course of all future development, it is essential that there be some measureable impact. Immediate, good reports from teachers and parents are not sufficient evidence upon which

PS 002013

to justify massive preschool programs.

Intelligence test results. Table 2 presents testing results on the Stanford-Binet Intelligence Scale for the Wave O experimental group and their controls over a four year period. At the start of preschool, there was no statistically significant difference between the group selected to receive preschool stimulation and those who were to remain at home without the program. By the end of one year of preschool, the experimental group had a 12.7 IQ gain (78.4 to 91.1). The control group had gained, without preschool, 7.2 IQ points (75.0 to 82.2). This difference in group means is statistically significant. However, at the end of kindergarten and again at the end of the first grade, the difference in group mean did not reach statistical significance as the experimental group decreased several IQ points and the control group gained several more points. By the end of second grade, the trend was complete and the experimental group was almost identical in measured intelligence with the control group. (85.5 vs 83.9).

Insert Table 2 About Here

While the data are not presented here, the measured intellectual growth pattern followed by Wave O is being closely paralled by each succeeding replication of this initial study.

Achievement Data

With this strong indication that intelligence test performance by children from limited environments attending regular schools will not be modified permanently by preschool experience, it is critical that the achievement pattern of preschool trained children be compared with those of the non-preschool group. A series of studies has found that, at the end of the kindergarten year, achievement on reading readiness tests and teacher rating of reading readiness show no statistically significant differences between control and experimental groups, (Henderson, 1965; Kirk, 1958). Indeed, Alpern (1966) even found that at the end of preschool there was no difference in reading readiness. More important to studies of preschool effectiveness are the achievement results in elementary grades for those

youngsters who have participated in programs as compared to those who did not. Table 3 gives the information on two years of achievement scores from the California Achievement Tests administered at the end of the first and second grades from the Perry Preschool Project.

Insert Table 3 About Here

The startling finding is that the experimental group is able to profit from regular school instruction and obtain a highly significant achievement superiority over the control group. This finding is even more striking when Table 2 is reviewed and it is recalled that the actual measured intellectual level is the same for both groups.

These data, then, suggest that preschool experiences for children from disadvantaged homes will not greatly change the measured intellectual level, but may provide the foundation necessary to produce improved academic achievement. In a school setting, groups of children from limited environments with preschool experience may be able to utilize better their general intellectual ability.

School behavior data. Information on school and social behavior has been the most elusive of data on preschool effectiveness. While nearly all preschool projects report that participating children are "more open" as a result of their experience, follow up information is seldom available.

Two social rating scales have been employed in the Perry project. The first, the Pupil Behavior Inventory was developed by Vinter and others (1966) of the School of Social Work, University of Michigan, for appraising classroom behavior of junior high delinquent boys. It was designed to measure behavioral and attitudinal factors which affect the degree of success a pupil will have in achieving educational goals. The scale is completed by teachers who rate each child on 34 different school related items on a five point scale. The original scale has been found to be adequate and has been used without revision for the purposes of the project. Five factor scores are obtained: Classroom conduct, Academic motivation and performance, Socio-emotional state, Dependence upon teacher, and Personal behavior.

Table 4 presents the ratings of the experimental and control groups from kindergarten through second grade: Three trends may be observed. The first trend is that only one of the five factors is statistically significant at each grade level, Academic motivation in kindergarten, Socio-emotional state in first grade, and Personal behavior in second grade. Second, and more important is that except for the teacher dependency factor, all mean ratings favor the experimental group on all factors each year. Third, children who have attended preschool were consistently seen by teachers as being equal or slightly more dependent upon a teacher's aid than children who have not attended preschool, indicating little difference in teacher-child relations in spite of more school experience by experimental children.

Insert Table 4 About Here

A second rating scale, the Ypsilanti Rating Scale, was developed to permit teachers to make more global ratings of child development. This scale includes four factors: Academic potential, Social development, Verbal skill, and Emotional adjustment.

Table 5 presents the information from this scale. While no significant differences were found in kindergarten or first grade, the experimental group was rated significantly better on three of the four factors in second grade. At all levels, the experimental group was rated higher than the control group on all factors. As on the Pupil Behavior Inventory, teachers assigned children in the experimental group increasingly higher ratings at each grade level on social development, while the ratings of the control group remained unchanged. Surprisingly, teachers did not rate experimental group children significantly higher in academic potential in spite of their better actual achievement on standardized tests.

Insert Table 5 About Here

On the whole, then, the results from teacher ratings of pupils for Wave O support the position that one year of preschool experience does make a difference in school behavior. In fact, the impact of preschool

seems to be increasing each year instead of becoming less.

Achievement and non-achievement groups. In the final analysis, the goal of most preschool projects is successful academic performance in school. With full recognition of the dangers involved in establishing groups after the data have been collected, Wave O experimental group children were divided into two sub-groups based upon first and second grade achievement test scores. Achievers were defined as those children who obtained California Achievement test total scores at or above the 12th per centile in both grades. Non-achievers were defined as those children with total scores at or below the 5th percentile. The mean second grade percentile rating for the achievers was the 37th percentile. This mean for the non-achievers was the 2nd percentile. An examination of scores of children in the control group disclosed that none obtained a California total score high enough to be classified as an achiever and that the group as a whole obtained a mean at the 3rd percentile level.

Table 6 presents the information on intelligence test scores for the achievers and non-achievers from the experimental group. While there is an initial mean difference in Stanford-Binet IQ, both groups showed a gain of about 14 points during the year of preschool. The difference between the groups is that in subsequent years the achievers maintained and improved their Stanford-Binet performance while the non-achievers gradually returned to their initial level of performance. While final differences in IQ were substantial, they are not statistically significant for these small groups.

Insert Table 6 About Here

Review of the results on the Pupil Behavior Inventory and the Ypsilanti Rating Scale show distinct trends. The achievers are consistantly rated higher than are the non-achievers, although the differences are seldom statistically significant. Teachers rated achievers significantly higher on academic motivation and potential than non-achievers by second grade, however. This is in line with actual achievement profiles, of course, and may reflect a good achievement-good behavior-good achievement cycle.

Non-achieving experimental childrn, on the two behavior rating scales, tend to occupy a position midway between achieving experimental children and the control group in general. The non-achieving children test below the control group on the Stanford-Binet but are no different in achievement.

DISCUSSION

Preschool has been highly heralded as a significant method for altering the patterns of intellectual growth, academic learning, and social adjustment of disadvantaged children. From these data, it would seem that the problems are more complex than initially thought. While the group of children who experienced a structured preschool did not record a permanent, long term gain in intellectual ability when compared to a control group, it is evident that the experimental group is actually two distinct sub-groups. When the sub-group that did produce academic achievement is examined, it is apparent that they obtained significant IQ growth in the year of preschool and consolidated that growth over the following three years. Further, they were able to profit from academic instruction offered by the elementary school, achieving only slightly below expectation for their intellectual level. Perhaps even more important, teachers rated them high on various social-behavior factors such as academic motivation, personal behavior, etc. In short, preschool experience, as an educational therapy, "worked" with about half of the youngsters.

For the experimental sub-group that did not respond to preschool, the pattern is also clear. After an initial gain in functional ability, measured by an IQ test, this sub-group reverted to its original level of functioning during the three year follow-up period. The group was unable to profit from regular academic instruction, demonstrating little, if any, academic achievement. There were social changes, however, as teachers tended to rate this sub-group more favorably than the control children as a group.

When the control group is examined, it is clear that none of the children is able to profit from regular school instruction and that teachers

rate their social behavior in less favorable terms than either of the experimental sub-groups.

It is difficult to place the preliminary findings presented in this paper in the framework of other current preschool research studies until more long term follow-up data are available. In general, all programs which employ a carefully structured preschool curriculum (Kohlberg, 1967; Sprigle, 1967; Weikart, 1967$_b$) report first year IQ gains of about 15 points, depending on the population served. These data are a far cry from those reported by Smilansky (1966) of an average IQ gain of 30 points for disadvantaged Israeli children in preschool projects of the Szold Institute. On the whole, however, these preliminary results should be cause for rejoicing. Any time education can point to a technique that offers a 50% "cure" rate with mean gains of 16 IQ points of four years duration, almost average achievement for a two year period, and good social behavior ratings, we have something to be enthusiastic about. Yet these findings are based on a small pilot sample. Worse yet, the experiment is in the process of being replicated not once but five times. This spring all Waves in the project will be tested again and more evidence as to whether these initial findings are represenative will be forth coming. It is not possible to make too many claims when the data which may refute these claims may be collected by my own staff.

Then too, several issues are raised as a result of these findings. One of the more important is why was the curriculum effective with only half of the youngsters: An extended study of structured preschool curriculum methods is called for. Alternative efforts to reach children at an even earlier age also seem appropriate. Other preschool styles might be employed such as home teaching to involve the mother as a supporting aide to promote intellectual growth. Second, why were at least half of the children able to profit from the regular elementary school curriculum? It has become fashionable to say that the reason for the failure of Headstart children to achieve in kindergarten or first grade is the curriculum and teaching they encounter. Apparently this is not so. It is the training they received before they entered elementary school that is equally in error.

Third, academic success procedes changes in behavior and motivational patterns. On the basis of standardized achievement tests, the achieving group was differentiated from the non-achieving and control groups in the first grade, but teachers did not recognize a difference in other areas until a year later.

The phase in preschool research as represented by the Perry project was essential in the development of educational answers to massive deprivation faced by minority group children. The initial evidence suggests that preschools can alter intelligence, school behavior and achievement for some children. Meaningful action to ameliorate the problems of disadvantaged children is possible. But preschools are not the sole solution. Other methods must be found so that more children can be reached. The goal is to identify critical situations that produce and/or prevent adequate intellectual development. Preschools can contribute to that goal.

REFERENCES

Alpern, G. D., The failure of a nursery school enrichment program for culturally disadvantaged children. American Journal of Orthopsychiatry, 1966, 36, 244-245.

Henderson, A. S., 1967-65 Annual progress report to the Ford Foundation on the preschool and primary education project. Council for Human Services, Herrisburg, Pennsylvania, 1965.

Kirk, S. A., Early education of the mentally retarded. Urbana: University of Illinois Press, 1958.

Kohlberg, L. and Jensen, J., Assessment of a Montessori approach. Paper presented at the 1967 Annual Meeting of American Educational Research Association, New York.

Smilansky, M., Fighting deprivation in the promised land. Saturday Review, 1966, 49, No. 42, 82-86, 91.

Sprigle, H. A., and Van De Riet, V., Effects of a sequential program of guided learning experiences and innovations in pedagogy. Paper presented at the 1967 Annual Meeting of American Educational Research Association, New York.

Vinter, R. D., Sarri, R. C., Vorwaller, D. J., and Schafer, W. E., Pupil behavior inventory. Ann Arbor, Michigan: Campus Publishers, 1966.

Weikart, D. P., Preschool intervention: A preliminary report of the Perry preschool project. Ann Arbor, Michigan: Campus Publishers, 1967_a.

Weikart, D. P., Preschool programs: Preliminary findings. Journal of Special Education, 1967_b, No. 2

Table 1

Characteristics of Wave O at the Time of Entrance

September 1962

Characteristics	Experimental	Control
Size of Sample	13	15
Mean Stanford-Binet IQ	78.4	75.0
Mean Cultural Deprivation Rating	8.5	8.2
Percent of Boys	62%	60%
Percent of Working Mothers	8%	20%

Table 2

Stanford-Binet Intelligence Scale

Wave O Data

Time of Comparison	Experimental (N-13)	Control (N-15)	Difference	Significance
Fall, 1962 - Entrance into preschool	78.4	75.0	3.4	n.s.
Spring 1963 - Completion of one year in preschool	91.1	82.2	8.9	.01
Spring 1964 - Completion of kindergarten	38.9	84.6	4.3	n.s.
Spring 1965 - Completion of first grade	90.7	84.6	6.1	n.s.
Spring 1966 - Completion of second grade	85.5	83.9	1.6	n.s.

Table 3

California Achievement Tests

Wave O Data

Mean Percentile Rank

Spring, 1965, completion of first grade.	Experimental	Control	Difference	Significance
Reading	30	8	22	.05
Arithmetic	10	3	7	.05
Language Skills	39	16	23	.05
	—	—	—	—
Total	22	5	17	.05

Spring, 1966, completion of second grade	Experimental	Control	Difference	Significance
Reading	23	4	19	.05
Arithmetic	17	5	12	.05
Language Skills	20	3	17	n. s.
	—	–	—	—
Total	18	3	15	.05

Table 4

Pupil Behavior Inventory

Wave O Data

Factors	Experimental	Control	Difference	Significance
Spring, 1964 - Kindergarten				
Classroom Conduct	3.737	3.666	.071	n.s.
Academic Motivation	3.385	2.667	.718	.05
Socio-Emotional State	3.723	3.557	.166	n.s.
Teacher Dependence	3.269	3.557	-.288	n.s.
Personal Behavior	4.244	3.905	.339	n.s.
Spring, 1965 - First Grade				
Classroom Conduct	3.639	3.633	.006	n.s.
Academic Motivation	3.523	2.943	.580	n.s.
Socio-Emotional State	3.954	3.353	.601	.05
Teacher Dependence	3.500	3.233	.267	n.s.
Personal Behavior	4.333	4.092	.241	n.s.
Spring, 1966 - Second Grade				
Classroom Conduct	3.804	3.434	.370	n.s.
Academic Motivation	3.273	2.682	.591	n.s.
Socio-Emotional State	3.969	3.557	.412	n.s.
Teacher Dependence	3.635	3.643	-.008	n.s.
Personal Behavior	4.410	3.982	.428	.05

Table 5

Ypsilanti Rating Scale

Wave O Data

Factors	Experimental	Control	Difference	Significance
Spring, 1964 - Kindergarten				
Academic potential	13.85	11.38	2.47	n.s.
Social Development	12.77	12.07	.70	n.s.
Verbal skill	4.54	3.64	.90	n.s.
Emotional adjustment	8.31	7.57	.74	n.s.
Spring, 1965 - First Grade				
Academic potential	13.50	10.13	3.37	n.s.
Social Development	14.08	12.40	1.68	n.s.
Verbal skill	4.50	3.93	1.07	n.s.
Emotional adjustment	10.50	9.40	1.10	n.s.
Spring, 1966 - Second Grade				
Academic potential	13.54	11.00	2.54	n.s.
Social development	15.92	11.07	4.85	.01
Verbal skill	5.08	3.64	1.44	.01
Emotional adjustment	10.77	7.71	3.06	.01

Table 6

Stanford-Binet Intelligence Scale

Achievers and Non-Achievers[a], Wave O Data

Time of Testing	High Achievers (N=5)	Low Achievers (N=5)	Difference	Significance
Fall, 1962 - Entrance into preschool	82.0	75.6	6.8	n. s.
Spring, 1963 - Completion of one year in preschool	96.0	89.8	6.2	n. s.
Spring, 1964 - Completion of kindergarten	99.2	80.8	18.4	.05
Spring, 1965 - Completion of first grade	98.4	85.2	13.2	n. s.
Spring, 1966 - Completion of second grade	98.2	78.8	19.4	.05[b]

[a] Achievers are defined as those who obtained a California Achievement Test total score above the 12th percentile level in both first and second grades. Non-achievers are those whose scores were below 5th percentile in both grades.

[b] Analysis of covariance was performed to adjust for initial mean differences. Adjusted Spring, 1966, difference was 14.4, and it is not significant in this small sample.